Nov. 23, 1948. E. A. HEIM 2,454,604

JOIST AND GIRDER CONSTRUCTION

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Fig. 1.

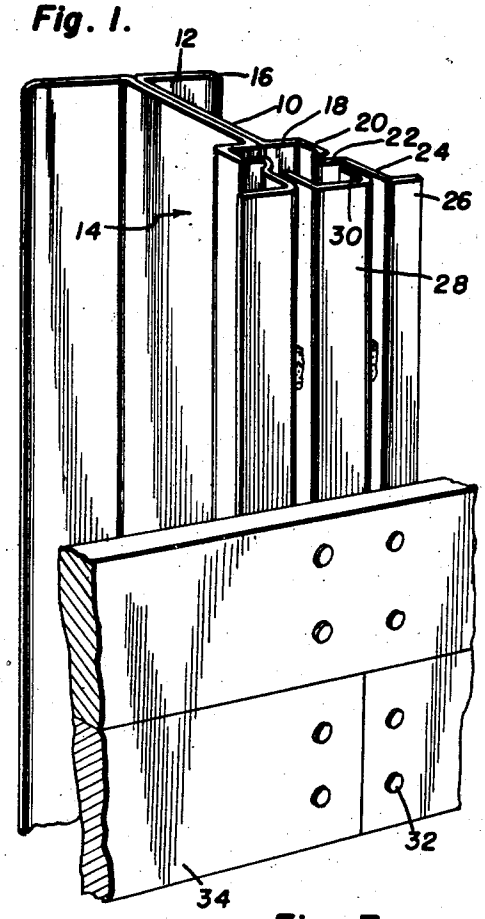


Fig. 6.

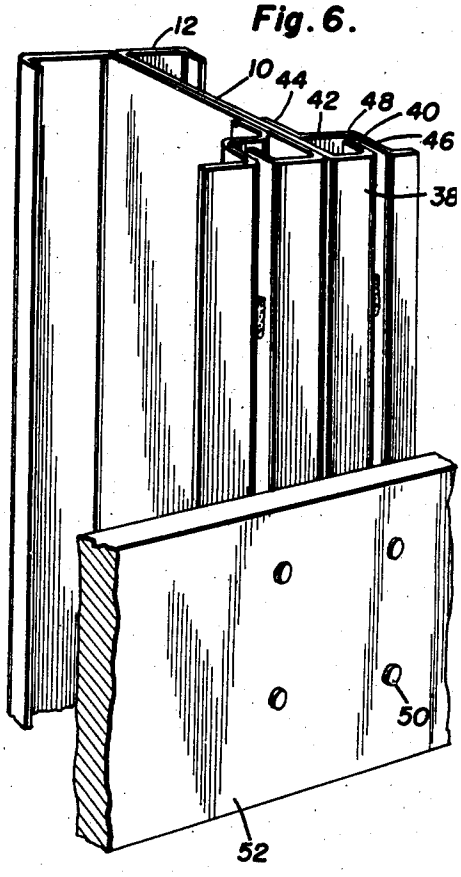
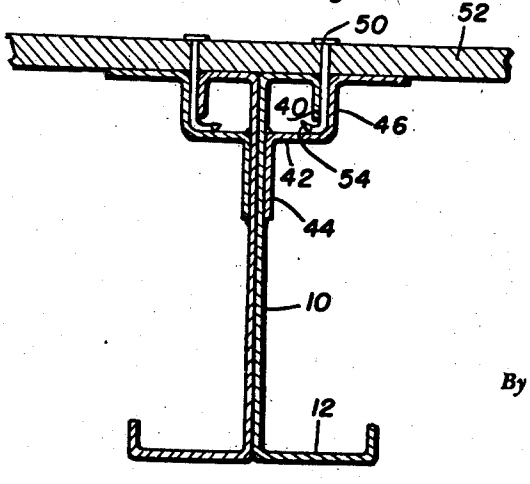


Fig. 7.



Inventor

Edward A. Heim

By Thomas A. O'Brien and Harvey B. Jackson

Attorneys

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Fig. 2.

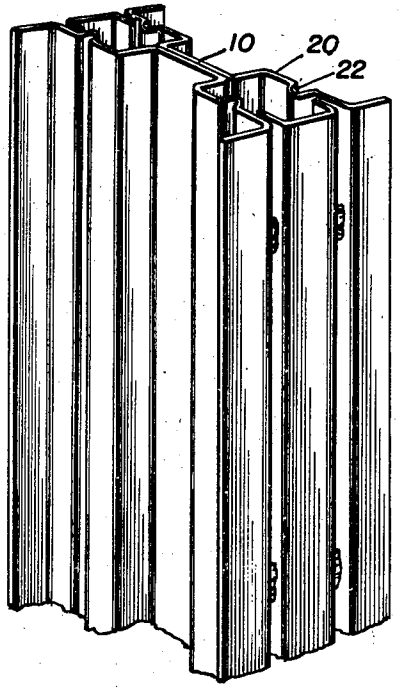


Fig. 3.

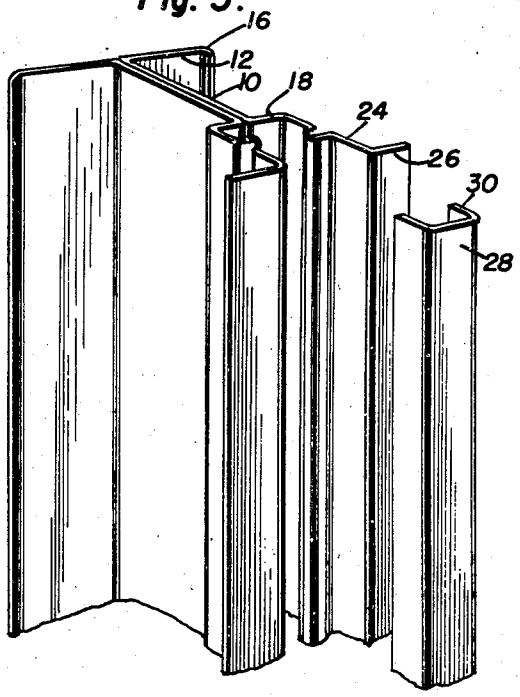


Fig. 4.

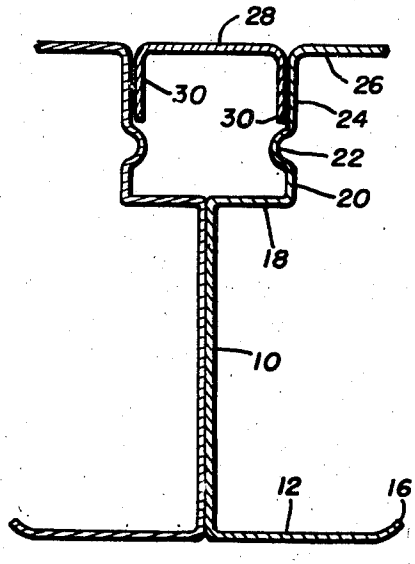
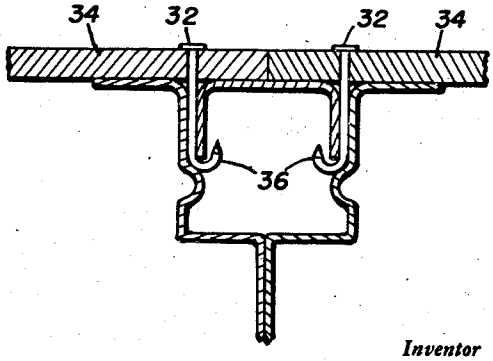


Fig. 5.



Inventor
Edward A. Heim

By Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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JOIST AND GIRDER CONSTRUCTION

Edward A. Heim, Lisbon, Ohio

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2 Claims. (Cl. 189—37)

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This invention relates generally to structural members used in buildings requiring members adapted to withstand variously applied stresses and to receive and hold nails driven thereinto for the purpose of attaching thereto sheeting, rock lath or other floor ceiling or wall structure, this member being envisaged as constructed of metal, such as pressed steel, and having means whereby nails or similar fastening devices driven through the attached members into the members which form the subject matter of this invention are turned or clinched.

It is an object of this invention to provide a joist or girder construction in which two spaced substantially flat surfaces are provided for the support of the member and the structure to be secured thereto.

It is another object of this invention to provide a structural element which will be the whole equivalent of a wooden member of joist, girder or studding character, with regard to the ability thereof to receive and hold fastening nails whereby wall, or ceiling and floor covering materials such as laths, sheeting, or other metal or wood building material of this general character may be secured, these improved structural elements also providing the full equivalent of a wooden beam or joist as regards rigidity and load-carrying strength, all without unduly great weight or other disadvantageous features.

Another object of this invention is to provide a device of this character in which two or more spaced nail receiving means are provided along the full length of the structural member.

And a last object to be specifically mentioned is to provide a device of this character which is relatively inexpensive and practicable to manufacture, simple and convenient to use, and which will give generally efficient and durable service.

It is well understood that devices have been developed and used wherein metal structural elements have been adapted to receive nails and to bend a portion of the same in a manner somewhat analogous to the manner in which the present invention receives and clinches the nails driven thereinto. A basic patent for such structure is therefore not sought, but what is sought to be protected by Letters Patent includes the improvements and refinements in such structural elements, whereby the same are made more adaptable for generally carrying out the functions required thereof in the general practice of the building trade. As illustrative of such improvements, it may be noted that this present invention is adapted for the securement of the

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ends of two other structural elements, such as lath or boards, in abutting relation on a single joist, as may be better understood if reference is had to Figure 1 of the drawings. Furthermore, according to the present invention, the nails may be turned or clinched to any desired degree, rather than being merely slightly bent, as provided for in other devices developed for the same general purpose as this invention.

With the above objects definitely in view, this invention resides in certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings which form a material part of this application, and in which:

Figure 1 is a view, in perspective, of this improved structural member with portions of three lath sections secured thereto by nails;

Figure 2 is a perspective view of a modified form of this invention in which nail-receiving and nail-clinching means are provided at both ends of the web portions of the structural element;

Figure 3 is a grouped view of the three portions of the structural element, as illustrated in Figure 1, but before the elements are welded together;

Figure 4 is a transverse sectional view, slightly enlarged, of the structure shown in Figure 1;

Figure 5 is a fragmentary transverse sectional view, showing a portion of the structural element as indicated in Figure 4, but with fragmentary portions of two sections of lath secured thereto by nails;

Figure 6 is a perspective view of a second modification of this invention, with a lath secured thereto by nails; and,

Figure 7 is a transverse sectional view of the modified form of this invention shown in Figure 6.

Similar characters of reference designate similar or identical parts and portions throughout the specification and throughout the several views of the drawings.

Referring now to these drawings in detail, and having reference particularly to Figures 1, 3, 4 and 5, it will be noted that this structural member is comprised of two similar channel members, each having a web portion 10, a right angularly disposed flange portion 12 and an irregularly shaped flange portion or side generally indicated by the numeral 14. The side flange 12 is split as at 16, if desired, and the side flange 14 is comprised of a right angularly bent portion 18, an

integral outer portion 20 disposed parallel to the web portion 10, an inwardly arced portion 22, a flat portion 24 which is essentially a continuation of the portion 20 and a right angular bent outer or lip flange 26.

A simple channel member, co-extensive with the main portion of the structural member and comprising a web portion 28 and two similar outer portions or side flanges 30, is secured, preferably by arc welding, within the two similar elements 14, the side flanges 30 being spaced a short distance from the adjacent portions 24, so that nails can be inserted therebetween. Such a nail is represented at 32 in operative relation with a portion of lath 34, secured by said nail to the improved structural member, and it will be noted that the point of the nail has been turned by the arcuate portion 22 and on being completely inserted, this point 36 is turned back or clinched against retraction thereof from the structural member.

Referring now to the modified form of this invention illustrated in Figure 2, it will be noted that provision is herein made for securement of the structural member at both ends thereof to other structure, in a manner identical with the manner in which one end of the structural member is secured to other structure as illustrated in Figures 1 and 5. This modification of the invention is particularly useful when the structural member is to be used as a joist or studding as in wall structure where sheathing or lath is required to be secured to two sides of the studding.

In the modification of this invention illustrated in Figures 6 and 7, it will be noted that the web 10 and side 12 are not altered, but the member 14 is deleted and a simple right angular flange 38 with a lip portion 40 disposed parallel to the web portion 10 are both formed integral with this web portion 10, and a guide member 42, right angularly and longitudinally bent at three points, is secured to the web portion 10 as at 44. This member 42 will ordinarily be spot welded to the web 10 and the portion 46 thereof will be spaced a short distance from the lip flange 40, to allow insertion of nails between these two portions 40 and 46. The right angular bend at 48 will preferably be of arcuate rather than sharp character, so that a nail 50 driven through a lath 52 will have the point 54 thereof turned or clinched, as illustrated in Figure 7.

The operation of this invention will be clear from a consideration of the foregoing description of the mechanical details thereof, taken in connection with the drawings and with the above recitation of the objects sought to be achieved by this invention and further description is, therefore, deemed unnecessary.

Though there have been shown three embodiments of this invention, this application is not limited to these particular embodiments, but it is desired to include in the scope of this invention the construction, combination and arrangement of parts and portions substantially as set forth in the appended claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. A structural member adapted to withstand variously applied stresses and to receive and to clinch nails driven thereinto, comprising channel members with portions of the web portions thereof secured together in back-to-back relation and with outer portions of the web portions in spaced relation, the corresponding sides of said channel members being in co-planar relation, and an elongated nail-guiding member secured to the channel members between and spaced from said outer portions, said guide member being disposed longitudinally of said channel members and comprising a channel member having flanges substantially parallel to said outer portions, and said outer portions having longitudinally extending arcuate portions adjacent the inner edges of the nail-guiding member, the said flanges terminating short of the arcuate portions.

2. A structural member adapted to withstand variously applied stresses and to receive and to clinch nails driven thereinto, comprising channel members with portions of the web portions thereof secured together in back-to-back relation and with outer portions of the web portions in spaced relation, the corresponding sides of said channel members being in co-planar relation, and an elongated nail-guiding member secured to the channel members between and spaced from said outer portions, said guide member being disposed longitudinally of said channel members and comprising a channel member having flanges substantially parallel to said outer portions, and said outer portions having longitudinally extending arcuate portions adjacent the inner edges of the nail-guiding member comprising inwardly disposed integral beads, the said flanges terminating short of the arcuate portions, the web portion of said nail guiding channel member having its outer surface co-planar with the outer surfaces of the side portions of the first mentioned channel members adjacent said web portions in spaced relation.

EDWARD A. HEIM.

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